STATE OF KANSAS
DEPARTMENT OF HEALTH AND ENVIRONMENT

ANNUAL DRINKING WATER REPORT FOR 1998

JUNE 1999

BILL GRAVES, GOVERNOR
Clyde Graeber, Secretary
Ronald Hammerschmidt, Director
Division of Environment

Bureau of Water
Public Water Supply Section
Forbes Field, Building 283
Topeka, KS 66620
(785) 296-5514

Printed on recycled paper

KANSAS DRINKING WATER
1998 ANNUAL COMPLIANCE REPORT

TABLE OF CONTENTS

KANSAS DRINKING WATER
1998 ANNUAL COMPLIANCE REPORT

LIST OF FIGURES

LIST OF TABLES

< KANSAS DRINKING WATER IN 1998 =

I. INTRODUCTION

The **Kansas Department of Health and Environment** (**KDHE**) is charged with protecting and improving the health and environment of Kansans through the wise stewardship of resources. To achieve this, KDHE's Bureau of Water, Public Water Supply Section is responsible for regulating all **public water supply** (**PWS**) systems in the state and assisting them in providing safe and potable water to the people of Kansas. There are over 1,100 public water supply systems in Kansas, consisting of municipal, rural water districts, and privately owned systems. These systems may serve a small community of several families up to a city of more than 300,000 persons.

This annual report on all PWSs in Kansas includes all maximum contaminant level (**MCL**), treatment technique, and monitoring violations occurring during the calendar year of **1998**. This report has been prepared by KDHE to inform the general public of the condition of drinking water in Kansas and in compliance with the federal **Safe Drinking Water Act** (**SDWA**).

II. PUBLIC WATER SUPPLY SYSTEMS

In the State of Kansas, a public water system (**PWS**) is defined by **Kansas Statute** (**K.S.**) 65-162a and **Kansas Administrative Regulation** (**K.A.R.**) 28-15-11(a) as a ***"system for delivery to the public of piped water for human consumption that has at least 10 service connections or regularly serves at least 25 individuals daily at least 60 days out of the year."*** These systems are regulated by KDHE to assure citizens are supplied safe and pathogen-free drinking water.

All PWSs are required by state regulation (K.A.R. 28-15-18(a)) to be operated and maintained by personnel that are properly trained and certified by KDHE.

During 1998, there were 1,122 PWSs serving water in Kansas. These PWSs served approximately 2.5 million Kansas residents in addition to the transient population visiting or traveling through the state.

PWSs are either community or non-community water systems. The majority of

PWSs are community water systems. Community water systems regularly serve a year-round residential population. Non-community water systems serve non-residential populations. Non-community PWSs that serve non-residential populations can either be transient or non-transient. Transient non-community water systems serve different people each day. Non-transient non-community water systems serve the same people each day. Table 1, below, summarizes the three types of PWSs. Figure 1, on the following page, shows the types and numbers of systems in operation during 1998.

TABLE 1.

TYPES OF PUBLIC WATER SUPPLY SYSTEMS

1. **COMMUNITY** - ***Same residential consumers every day*.**
   e.g.: towns, mobile home/trailer parks, rural water districts, subdivisions.

2. **TRANSIENT NON-COMMUNITY** - ***Different non-residential consumers every day*.**
   e.g.: motels, parks, airports, campgrounds, truck-stops.

3. **NON-TRANSIENT NON-COMMUNITY** - ***Same non-residential consumers every day*.**
   e.g.: schools, day care facilities, industrial or manufacturing facilities.

PWSs obtain water from two sources: **groundwater** (**GW**) or **surface water** (**SW**). Some PWSs obtain water from both groundwater and surface water.

Table 2 below, shows the three types of PWSs, the number of systems in each type, the number of systems using groundwater, surface water, or a combination of both, and the total population served by each PWS type. PWSs that use both surface and groundwater are governed by surface water regulations.

TABLE 2.
SUMMARY OF PUBLIC WATER SUPPLY SYSTEMS IN KANSAS

TYPE OF WATER SYSTEM	GW	SW	SW/GW	TOTAL (%)	POPULATION
Community Public Water Systems	584	295	53	932 (83%)	2,423,067
Non-Community-Transient PWSs	110	6	0	116 (10%)	1,430
Non-Community-Non-transient PWSs	72	1	1	74 (7%)	24,576

TOTAL	766	302	54	1,122 (100%)	2,449,073

FIGURE 1.

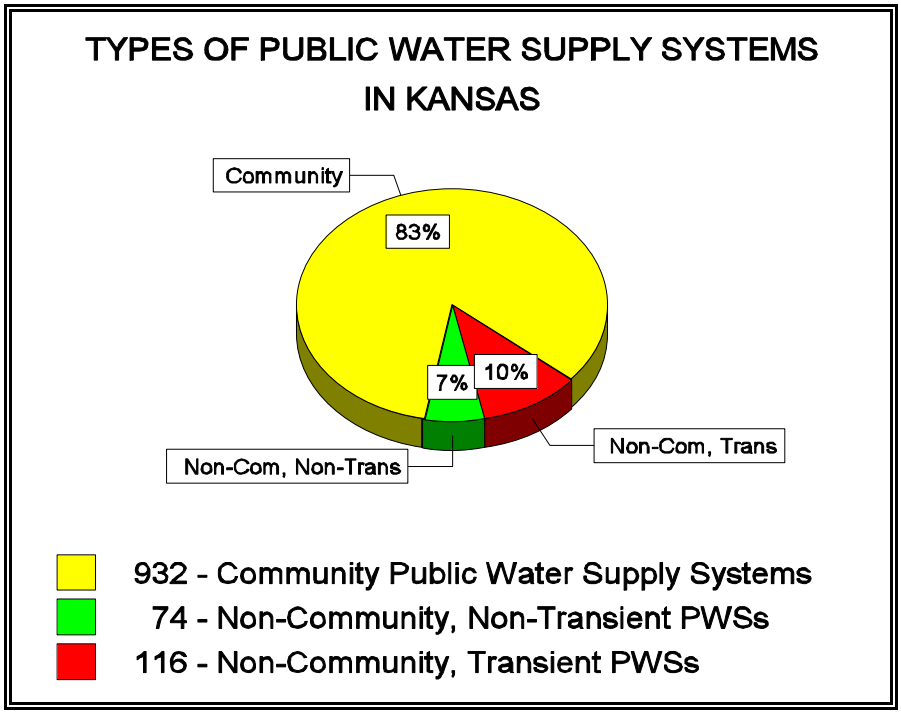


FIGURE 2.

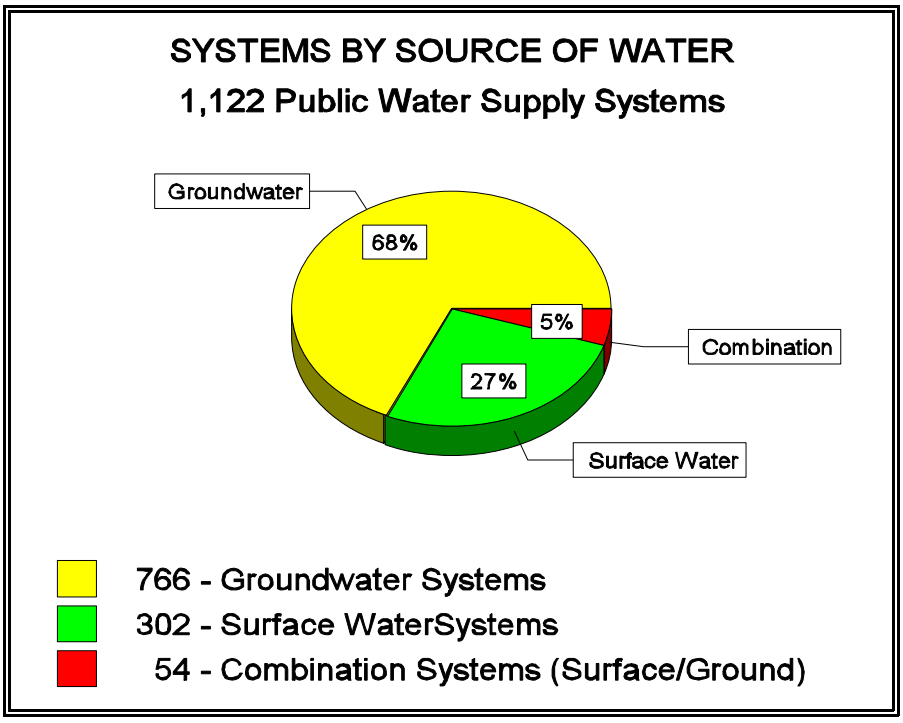


Figure 2 shows the numbers and percentages of systems using groundwater, surface water, or a combination of both.

FIGURE 3.

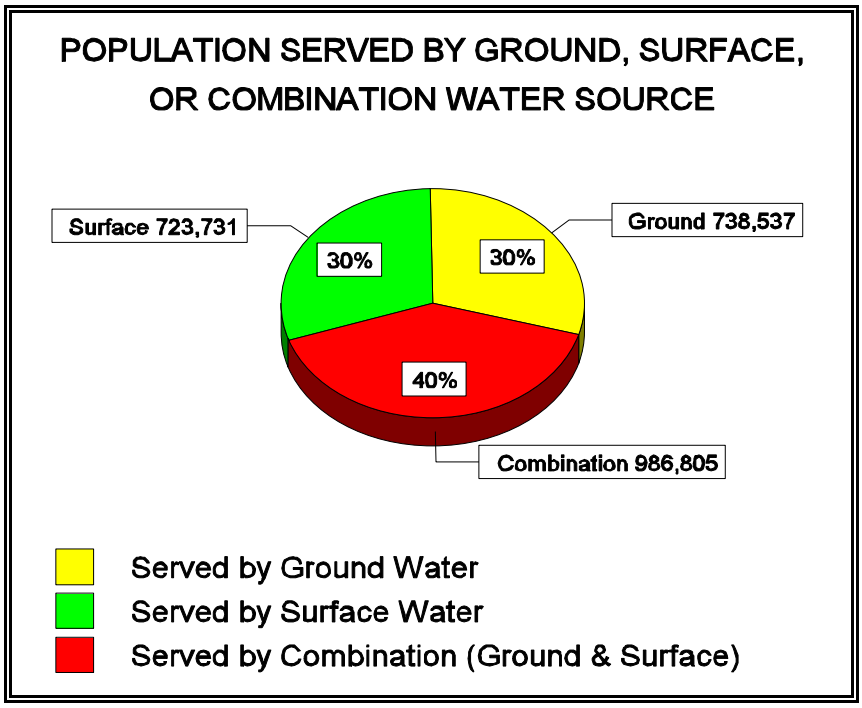


Figure 3 shows the resident population for all PWSs served by groundwater, surface water, or a combination of both sources. These numbers include systems purchasing surface or groundwater from other PWSs.

III. REGULATORY PROGRAMS

To help ensure good drinking water quality, several regulatory programs have been developed and implemented by KDHE. These programs monitor water quality in several different areas, ranging from microbiological organisms to organic and inorganic contaminants to radionuclides.

Kansas regulations establish maximum permissible levels for certain drinking water contaminants. These levels are known as **maximum contaminant levels** or **MCLs**. In some situations, regulations also require that minimum water **treatment techniques** (**TT**) be performed.

To verify compliance with these water quality standards, regulations require that PWSs regularly monitor and report water quality parameters. These requirements exist to assure that all PWSs provide safe drinking water for human consumption.

COMPLIANCE AND ENFORCEMENT

One of KDHE Bureau of Water's goals is to assist PWSs in complying with all state and federal drinking water regulations.

The Bureau attempts to use technical assistance rather than formal enforcement action to return PWSs to compliance. When necessary, enforcement action is administered according to an escalation policy. The first step is to notify the PWS by mail that a violation occurred. If three violations occur within any twelve month period, a Directive is sent to the PWS. If violations continue then either a Consent Order or an Administrative Order, with or without a monetary fine, may be issued.

The KDHE's staff are available to assist PWSs with regulatory concerns, technical questions, or to help coordinate available resources that may be needed by a PWS.

KDHE **has not** issued any variances or exemptions from the SDWA requirements to any PWS and has not received any request for variances or exemptions from any PWS. All PWSs are expected to comply with all drinking water regulations and to perform public notice if and when violations occur.

Regulations administered by KDHE address the following areas of drinking water contaminants:

- **TOTAL COLIFORM BACTERIA**
- **PHASE II/V CHEMICALS**
- **LEAD AND COPPER**
- **DISINFECTION BY-PRODUCTS**
- **SURFACE WATER TREATMENT**
- **RADIONUCLIDES**

IV. TOTAL COLIFORM

Water serves a very important role in maintaining health since it can be a common medium for transmitting diseases. Since the discovery of the "germ theory of disease" in the late 1800's, the importance of pathogen-free water has been better understood and

appreciated. For this reason methods of disinfecting water have been developed. The most common method used today for disinfecting water is chlorination. Chlorination of drinking water has been practiced since the beginning of this century.

In Kansas all PWSs are required by state regulation K.A.R. 28-15-19(a) to disinfect all drinking water delivered to the public. To help evaluate the effectiveness of the disinfection method employed and determine microbiological quality, all systems are required by state regulation (K.A.R. 28-15-14) to submit monthly water samples for total coliform bacteria testing. Total coliform testing is used as an indicator of the possible presence of other bacteriological contaminants. Systems can choose to have this bacteriological testing of their water performed by KDHE's microbiology laboratory or a state certified private laboratory.

PWSs are required to collect a minimum number of water samples each month based on their population and previous sample results. All water systems in Kansas are required to collect a minimum of two water samples per month.

A summary of the results of approximately 40,000 water samples collected and analyzed for coliform bacteria during 1998 is presented in Table 3.

TABLE 3.
SUMMARY OF BACTERIOLOGICAL MONITORING RESULTS - 1998

QUARTER COLLECTED	NEGATIVE SAMPLES	COLIFORM POSITIVE	FECAL POSITIVE	INVALID SAMPLES	QUARTERLY TOTALS
First Quarter Samples:	9,156	65	9	21	9,251
Second Quarter Samples:	9,468	96	13	16	9,593
Third Quarter Samples:	9,887	221	38	23	10,169
Fourth Quarter Samples:	10,011	133	18	20	10,182
Total Samples for 1998:	38,522	515	78	80	39,195

Key: QUARTER = Every three month period; four quarterly periods in one year.
NEGATIVE = Samples with no coliform bacteria present.
COLIFORM POSITIVE= Samples with coliform bacteria present.
FECAL POSITIVE= Samples with fecal coliform bacteria present.
INVALID = Samples not analyzed (too old, excessive chlorine, insufficient sample volume).

COMPLIANCE AND ENFORCEMENT

PWSs that fail to collect any of the required water samples within the monthly compliance period are assessed a *routine monitoring violation*. Systems that have a water sample test positive for coliform bacteria are required to collect three repeat samples (also called check samples). If the PWS fails to collect these repeat (check) samples, the system is then assessed a *repeat monitoring violation*. Both of these monitoring violations require the system to issue public notice by publishing the violation notice in a local newspaper of general circulation.

The system can incur a **maximum contaminant level** (**MCL**) violation if a number of water samples test positive for total coliform, or the system can incur a more serious acute MCL violation if fecal coliform or E. coli are found along with the total coliform positive samples. In both cases, the system is required to notify the public of the violation through the electronic news media (radio and television) and publication of the violation notice in a local newspaper of general circulation.

A summary of all monitoring and MCL violations is presented in Table 4. Note that for the total number of PWSs (97) incurring a violation, systems incurring more than one type of violation are only counted once.

TABLE 4.
SUMMARY OF MONITORING VIOLATIONS AND
COLIFORM MCL VIOLATIONS IN 1998

TYPE OF VIOLATION	TOTAL # OF VIOLATIONS	# OF SYSTEMS IN VIOLATION	% OF SYSTEMS IN VIOLATION	% OF SYSTEMS IN COMPLIANCE
Monitoring	77	46	4 %	96 %
Coliform MCL	66	57	5 %	95 %
Acute Coliform MCL	10	10	1 %	99 %
Totals:	153	97*	9 %	91 %

* PWSs are only counted once, (16 PWSs had more than one type of violation).

A total of 77 bacteriological monitoring violations occurred during 1998. These 77 monitoring violations were incurred by 46 PWSs. In other words, 96 percent of all PWSs were in compliance with the bacteriological monitoring requirements. As shown in Table 4, on the previous page, only 4 percent of PWSs contributed to the number of bacteriological monitoring violations occurring in 1998.

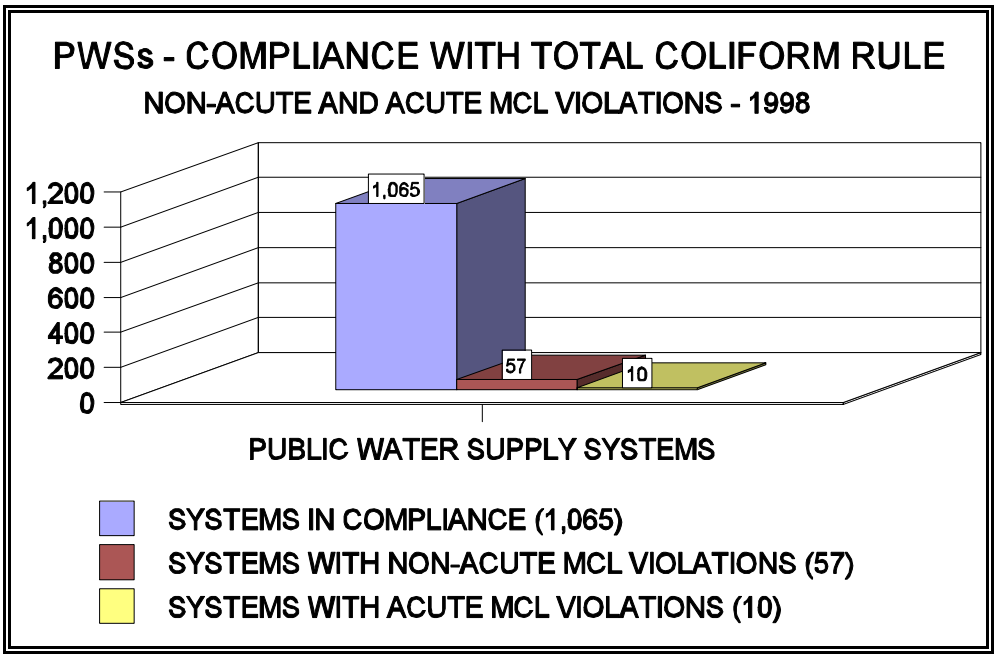
A total of 57 PWSs had MCL violations because water samples tested positive for coliform and/or fecal coliform bacteria. These 57 PWSs represent 5 percent of all PWSs. In other words, 95 percent of all systems were in compliance with the bacteriological MCL regulations during 1998.

Figure 4, below, shows a comparison between the PWSs that incurred an acute and non-acute MCL violations and those in compliance during 1998. Noted that the same ten systems that had an acute MCL violation also had a non-acute total coliform violation.

PWSs that have recurring monitoring and/or MCL violations are subject to being issued an Administrative Order, with or without penalty, from KDHE. Only one Administrative Order with penalty was issued during 1998, for bacteriological violations. Before an Administrative Order is issued, KDHE first issues a Directive in an attempt to correct the violation in a less formal way.

A list of the PWSs that incurred bacteriological monitoring and MCL violations is provided in Appendix B at the end of this report.

FIGURE 4.



V. PHASE II/V CHEMICAL RULE

The Phase II/V Chemical Rule is part of the National Primary Drinking Water Regulations of the SDWA. These regulations established **maximum contaminant levels** (**MCL**) and **treatment techniques** for various contaminants affecting drinking water, such as solvents, pesticides and herbicides, and heavy metals.

Kansas has adopted these federal drinking water regulations in the **Kansas Administrative Regulations** (**K.A.R.**). All the contaminants regulated by this rule may be harmful to human health at certain concentrations and many are toxic and/or carcinogenic.

This rule contains five groups of contaminants:

- **ASBESTOS**
- **NITRATE/NITRITE**
- **INORGANIC CHEMICALS (IOC)**
- **VOLATILE ORGANIC COMPOUNDS (VOC)**
- **SYNTHETIC ORGANIC COMPOUNDS (SOC)**

The Phase II/V Rule applies to all community water systems and non-transient non-community water systems. The nitrate/nitrite section of this regulation applies to transient non-community water systems. Water systems that purchase all their water from other systems are not required to monitor for the contaminants regulated by this Rule.

PWSs are required to monitor for these contaminants under a standardized monitoring schedule consisting of three compliance periods of three years each. During these compliance periods, PWSs are required to perform specific monitoring depending on the size of their population and whether they use surface or groundwater. The first three-year compliance period of this Rule began January 1, 1993 and ended December 31, 1995. The second compliance period began January 1, 1996 and ended on December 31, 1998.

PWSs using surface water are required to monitor more frequently than those using groundwater because surface water is more susceptible to contamination. PWSs with populations greater than 3,300 are also required to monitor more frequently than small systems with populations of 3,300 or less. The monitoring data presented in this report is for calendar year 1998, which was the last year of the second monitoring period.

With the exception of asbestos, this

regulation specifies that all the water samples must be collected at the **point of entry** (**POE**). The POE is defined as a point after raw water has been treated (disinfected) and before it enters the distribution system.

PWSs are out of compliance with this rule by either failing to monitor or having an MCL violation. These violations require the system to issue public notice by notifying all their consumers of the violation using newspaper, television, radio, mail, and/or posted notices.

V(a). ASBESTOS

Asbestos is a naturally occurring mineral found in the earth's crust in a fibrous form. Inhalation of asbestos fibers has been shown to produce lung tumors in laboratory animals and in humans. Ingestion of asbestos fibers greater than 10 micrometers in length has been shown to cause benign tumors in laboratory rats. To reduce the potential risk of cancer or other adverse health effects that have been observed in laboratory animals, EPA has set the drinking water standard for asbestos at 7 million fibers per liter (fibers longer than 10 micrometers).

Asbestos generally enters drinking water either from contact with natural mineral deposits or asbestos-cement pipes used in water distribution systems. Geologically, Kansas does not have any naturally occurring asbestos. Therefore, KDHE waived source water asbestos monitoring for all PWSs. However, PWSs that utilize asbestos-cement pipes in their distribution system were required to test for asbestos. To identify systems having asbestos-cement pipes in 1993, KDHE conducted a survey of all PWSs. The results of this survey yielded 208 PWSs having asbestos-cement pipe. These systems were required to monitor for asbestos in their distribution systems, before the end of the first compliance period (December 31, 1995).

ASBESTOS MONITORING RESULTS

All analyses for asbestos were performed by private certified laboratories during 1993 through 1995. Of the 208 PWSs required to monitor for asbestos, 207 systems tested below 0.2 **million fibers** per **liter** (**MFL**) detection limited. Only one system had a concentration of asbestos greater than the MCL of 7 MFL. This system was required to perform public notice and monitor quarterly for asbestos during 1995. The results of this quarterly monitoring were consistently below the MCL. An investigation of the system determined the cause of the earlier asbestos MCL exceedance was due to a pigging

operation (cleaning inside of pipes) involving asbestos cement pipes in the distribution system prior to the initial monitoring. Follow up monitoring indicated the system returned to compliance.

No monitoring of asbestos was required or done by any PWS during 1998. PWSs that already monitored for asbestos during the 1993-1995 compliance period are not required to monitor again for asbestos until after the year 2002.

V(b). NITRATE / NITRITE

Many drinking water contaminants, such as nitrate and nitrite are found naturally occurring in the environment. Nitrogen may find its way into the groundwater from decaying plant and animal matter, precipitation, and urban runoff. Fertilization of agricultural and urban land with ammonium nitrate, and runoff from livestock operations are a significant cause of nitrate contamination of groundwater.

Excessive amounts of nitrate and nitrite can cause methemoglobinemia in infants, also known as "blue-baby syndrome." To safeguard infants from this condition, Kansas regulations (K.A.R. 28-15-13(b)) set the MCL at 10 **milligrams per liter** (**mg/l**) for nitrate and 1 mg/l for nitrite as the maximum allowable concentration in public drinking water supplies. Kansas regulations (K.A.R. 28-15-14(b)) require PWSs with their own sources of water to monitor all their **points of entry** (**POE**) at least once a year for nitrate. PWSs that exclusively use purchased water from other systems are exempt from this monitoring.

NITRATE MONITORING RESULTS

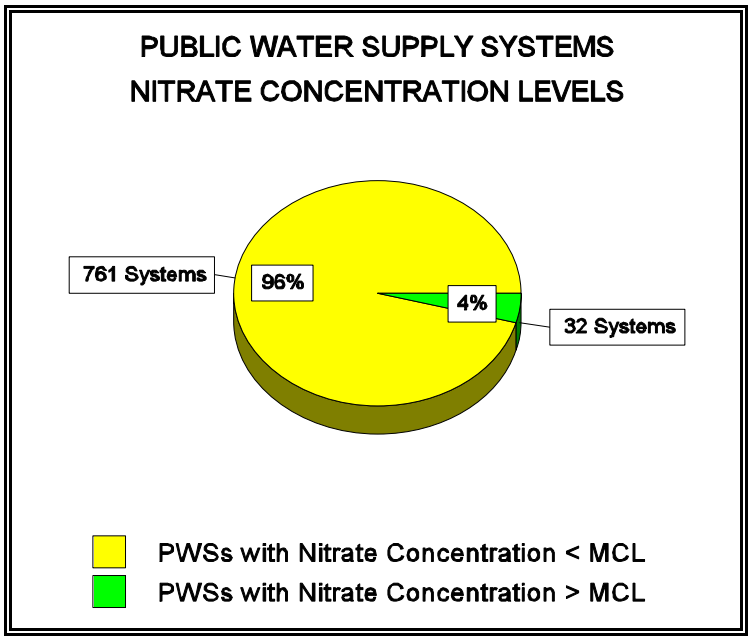
To comply with these drinking water regulations, 793 PWSs were required to monitor their POEs for nitrate during 1998. Sixty-five water samples had analytical results greater than the nitrate MCL of 10 mg/l. These 65 water samples were collected from 30 PWSs. Two additional PWSs had nitrate MCL violations because they purchase water from a system that had a nitrate MCL violation.

The average nitrate MCL violation for samples collected during 1998, resulted in a concentration of 14 mg/l. The median concentration of all nitrate MCL violations resulted in 13 mg/l. This means that 50 percent of all nitrate MCL violations were less than 13 mg/l.

Figure 5, graphically shows the number of PWSs that incurred a nitrate MCL violation

in comparison with the number of PWSs in compliance with the nitrate MCL.

FIGURE 5.



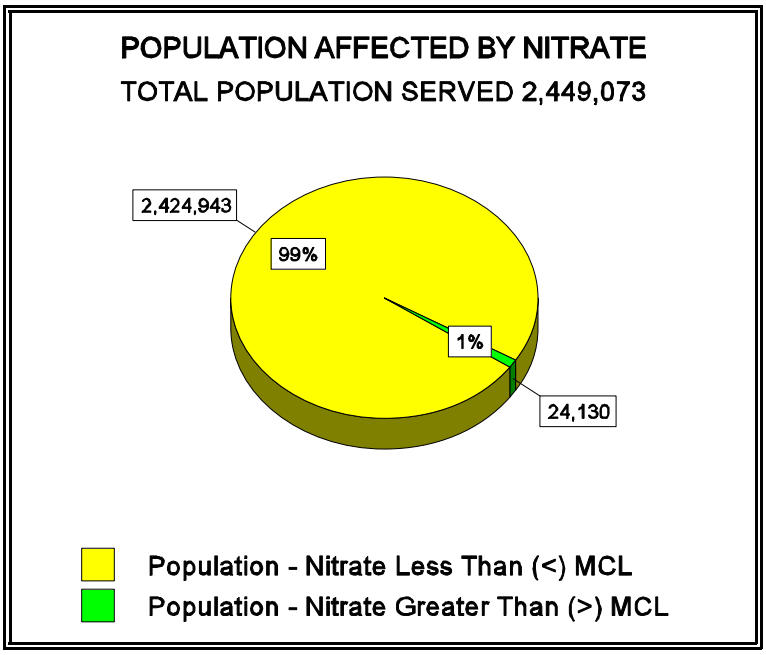
COMPLIANCE AND ENFORCEMENT

PWSs with nitrate monitoring results above the MCL or failing to monitor were required to do public notice and provide proof to KDHE that public notice was performed. All PWSs with nitrate violations performed the required public notice. PWSs with MCL violations were also required to monitor for nitrate at least quarterly.

During 1998, four PWSs entered into Consent Orders with KDHE in order to address their nitrate MCL violations. These Consent Orders require the PWSs to provide an alternate source of drinking water that meets all drinking water MCL regulations, to the population at risk whenever their regular source of water tests over the nitrate MCL. The PWS must also issue public notice for all MCL violations and distribute nitrate / nitrite toxicity information to local health care providers.

The total population served by all water systems monitoring for nitrate was 2,449,073. The total population of PWSs with no POE monitoring results exceeding the nitrate MCL was 2,424,943. The total population of PWSs with a POE monitoring result exceeding the MCL was 24,130, which equals less than one percent of the total population. The following, figure, graphically shows the population affected by nitrate MCL violations in comparison with the population of PWSs in compliance.

FIGURE 6.



The PWS with the largest population affected by nitrate MCL violations was the city of Abilene with a population of 6,727. The Abilene PWS was operating under a Nitrate Consent Order issued in 1995 by KDHE.

In October 1998, Abilene completed a new water treatment plant with a reverse osmosis membrane filtration system. Since the new water treatment plant went into service Abilene has been in compliance with the nitrate MCL.

Dickinson County Rural Water District #2, which had been in violation of the nitrate MCL is now in compliance since it is purchasing all its water from the city of Abilene.

The city of Lucas also has been operating under a Nitrate Consent Order issued by KDHE. In December of 1998, the Lucas PWS completed installation of an ion exchange water treatment system to remove nitrate from their drinking water. Since the new treatment system has been in operation Lucas has had no violations of the nitrate MCL. Other PWSs that are operating under Consent Orders are currently looking for new sources of water that meet all MCL requirements for drinking water.

The names of PWSs that incurred nitrate MCL violations during 1998 are listed in Appendix B. At the end of 1998, the average population of PWSs affected by nitrate concentrations greater than the nitrate MCL decreased to 577.

V(c). INORGANIC CHEMICALS

Substances that do not have any carbon atoms in their composition are called **inorganic chemicals** (**IOC**). Two major classes of inorganic chemicals are metal and non-metals. Kansas regulations (K.A.R. 28-15-13(b)) set MCLs for eight metals and two non-metal contaminants. Table 5, on the following page lists these IOC contaminanats and their MCLs in **milligrams per liter** (**mg/l**). Most of these IOCs occur naturally in the environment and are soluble in water. Because of this, they are potential contaminants of drinking water. Not all IOCs originate from natural mineral deposits. Industrial activities such as metal finishing, textile manufacturing, mining operations, electroplating, manufacturing of fertilizers, paints, and glass can also generate these contaminants.

Inorganic contaminants can be toxic to humans at certain levels. Cadmium, chromium, and selenium can cause damage to the kidneys, liver and nervous and circulatory systems. Barium has been associated with high blood pressure and mercury has been shown to damage kidneys. Antimony, beryllium, cyanide, nickel and thallium have been shown to damage the brain, lungs, kidneys, heart, spleen and liver.

Sulfate, a naturally occurring compound, is the only unregulated IOC at the present time. This means that sulfate has no MCL established for it, but it must be monitored for along with the regulated IOCs.

IOCs can be removed from drinking water using various available technologies such as coagulation/filtration, lime softening, reverse osmosis, ion exchange, chlorine oxidation, activated alumina, and granular activated carbon.

TABLE 5.

REGULATED INORGANIC CHEMICALS (IOC)

Chemical Name	Maximum Contaminant Level (MCL)	
Antimony	*0.006*	*mg/l*
Arsenic	*0.05*	*mg/l*
Barium	*2*	*mg/l*
Beryllium	*0.004*	*mg/l*
Cadmium	*0.005*	*mg/l*
Chromium	*0.1*	*mg/l*
Cyanide	*0.2*	*mg/l*
Fluoride	*4*	*mg/l*
Mercury	*0.002*	*mg/l*
Selenium	*0.05*	*mg/l*
Thallium	*0.002*	*mg/l*

IOC MONITORING FREQUENCY

All community and non-transient non-community PWSs are required to monitor each **point of entry** (**POE**) for IOCs. PWSs using groundwater as their sole source must monitor at least once during every three year compliance period (1996 through 1998). Systems using surface water as a source must monitor for IOCs at least once a year. Systems exclusively purchasing treated water as their source are exempt from this monitoring.

PWSs incurring a MCL violation are required to increase their monitoring to at least quarterly. PWSs having a MCL or monitoring violation are required to notify their customers of such violations by issuing a public notice.

IOC MONITORING RESULTS

A total of 152 PWSs monitored for IOCs during 1998. Other than nitrate, selenium was the only inorganic chemical detected above its MCL of 0.05 mg/l. Five PWSs incurred 14 selenium MCL violations. These five systems had previously high levels of selenium detected in 1997, and were monitoring quarterly for selenium during 1998.

The total population affected by these selenium MCL violations was 1,530. The average population of PWSs with selenium MCL violations was 306.

All other IOC results were within acceptable ranges or below MCLs. The names of systems that incurred a selenium MCL

violation are listed in Appendix B. No PWSs had IOC monitoring violations during 1998.

COMPLIANCE AND ENFORCEMENT

During 1998, the cities of Glade and Logan each signed Consent Orders with KDHE, addressing their selenium MCL violations. The Consent Order for Logan also addressed the city's nitrate violations. These Consent Orders did not impose any monetary penalties on these cities.

These Consent Orders require the cities work with KDHE, environmental consultants, and contractors to remediate the high selenium level in their waters. The Consent Orders require the cities to prepare and submit to KDHE a feasibility study recommending possible solutions to return the PWSs to compliance with the selenium MCL. Under the Consent Orders the PWSs are required to perform quarterly monitoring and issue public notice whenever monitoring results violate the selenium MCL.

The five PWSs in violation of the selenium MCL represent less than one percent of the total systems in Kansas, translating into a compliance rate greater than 99 percent.

V(d). VOLATILE ORGANIC COMPOUNDS

Volatile organic compounds (**VOC**) are commonly referred to as organic solvents. These compounds are generally found as constituents of many degreasers, industrial cleaners, spot/stain removers, paint thinners, in some paints, varnishes and lacquers, in many paint removers/strippers, in many pesticides/herbicides, in most dry cleaning chemicals, in many printing inks and printing press chemicals, in most petroleum products including many types of fuels. These compounds can often be identified by their distinct aromatic odor. Most of these compounds are flammable and toxic to varying degrees. Because of these characteristics, they are also a potential source of environmental pollution and pose a health hazard when present in drinking water.

Kansas has established regulations governing VOCs in drinking water. These regulations, K.A.R. 28-15-14, specify when a PWSs must monitor their POE for VOC contaminants. Large PWSs, serving populations of more than 3,300 people, are required to sample each POE at least annually. Small PWSs serving populations of 3,300 or less are required to sample each POE at least once during the three year compliance period (1996 through 1998). If any contaminants are detected during this regular monitoring additional monitoring is required.

Kansas regulations K.A.R. 28-15-13, set MCLs for each VOC contaminant listed in Table 6. PWSs are also required to test for unregulated VOC contaminants. Unregulated contaminants are those for which no MCL has been established. Test for these unregulated VOC contaminants are done in order to determine occurrence and evaluate health risk. Using data from these unregulated contaminants, appropriate MCLs can be established in the future. Table 7, on the following page, contains a list of unregulated VOCs that are required to be monitored by PWSs.

TABLE 6.

REGULATED VOLATILE ORGANIC COMPOUNDS (VOC)

Compound Name	MCL		Uses
Benzene	*0.005*	*mg/l*	*fuels, pesticides, paints, pharmaceutical*
Carbon tetrachloride	*0.005*	*mg/l*	*degreasing agents, fumigants*
Chlorobenzene	*0.1*	*mg/l*	*industrial solvents, pesticides*
p-Dichlorobenzene	*0.075*	*mg/l*	*insecticides, moth balls*
o-Dichlorobenzene	*0.6*	*mg/l*	*insecticides, industrial solvents*
1,2 Dichloroethane	*0.005*	*mg/l*	*gasoline, insecticides*
1,1 Dichloroethylene	*0.007*	*mg/l*	*paints, dyes, plastics*
cis-1,2 Dichloroethylene	*0.07*	*mg/l*	*industrial solvents, chemical manufacturing*
trans-1,2 Dichloroethylene	*0.1*	*mg/l*	*industrial solvents, chemical manufacturing*
Dichloromethane	*0.005*	*mg/l*	*paint strippers, refrigerants, fumigants*
1,2 Dichloropropane	*0.005*	*mg/l*	*soil fumigants, industrial solvents*
Ethylbenzene	*0.7*	*mg/l*	*gasoline, insecticides*
Styrene	*0.1*	*mg/l*	*plastics, synthetic rubber, resins*
Tetrachloroethylene	*0.005*	*mg/l*	*dry cleaning/industrial solvents*
Toluene	*1*	*mg/l*	*gasoline, industrial solvents*
1,2,4 Trichlorobenzene	*0.07*	*mg/l*	*industrial solvents*
1,1,1 Trichloroethane	*0.2*	*mg/l*	*metal cleaning/degreasing agent*
1,1,2 Trichloroethane	*0.005*	*mg/l*	*industrial degreasing solvents*
Trichloroethylene	*0.005*	*mg/l*	*paint strippers, dry cleaning, degreasers*
Vinyl chloride	*0.002*	*mg/l*	*plastics/synthetic rubber, solvents*
Xylenes	*10*	*mg/l*	*paints/inks, solvents, synthetic fibers, dyes*

TABLE 7.

UNREGULATED VOLATILE ORGANIC COMPOUNDS (VOC)

Bromoenzene	*o-Chlorotoluene*	*Hexachlorobutadiene*
Bromohloromethane	*p-Chlorotoluene*	*Isopropylbenzene*
Bromodichloromethane	*Dibromomethane*	*p-Isopropyltoluene*
Bromoform	*m-Dichlorobenzene*	*Naphthalene*
Bromomethane	*Dichlorodifluoromethane*	*n-Propylbenzene*
sec-Butylbenzene	*1,1-Dichloroethane*	*1,1,1,2 Tetrachloroethane*
n-Butylbenzene	*2,2-Dichloropropane*	*1,1,2,2 Tetrachloroethane*
tert-Butylbenzene	*1,3-Dichloropropane*	*1,2,3-Trichlorobenzene*
Chlorodibromomethane	*1,1-Dichloropropene*	*1,2,3-Trichloropropane*
Chloroethane	*1,3-Dichloropropene*	*1,2,4-Trimethylbenzene*
Chloroform	*Fluorotrichloromethane*	*1,3,5-Trichlorobenzene*
Chlorormethane		

VOC MONITORING RESULTS

During 1998, 422 POE water samples from 232 PWSs were monitored for all regulated and unregulated VOCs

VOC monitoring during 1998, concluded with no PWSs having any water samples test greater than the MCL for any VOC. No PWS incurred a VOC monitoring violation during 1998.

V(e). SYNTHETIC ORGANIC COMPOUNDS

Synthetic organic compounds (**SOC**) are man-made compounds, many of which are chlorinated and used as herbicides, pesticides, fungicides and insecticides. Kansas regulation, K.A.R. 28-15-14, requires PWSs to monitor their drinking water for 33 SOCs. MCLs for each of these SOC contaminants is set by Kansas regulation, K.A.R. 28-15-13.

PWSs failing to monitor or incurring an MCL violation for any of the compounds listed in Table 8, on the following page, must notify the public of such violation and provide proof of performing such public notice to KDHE.

TABLE 8.

REGULATED SYNTHETIC ORGANIC COMPOUNDS (SOC)

Compound Name	MCL		Uses
Alachlor (Lasso)	*0.002*	*mg/l*	*herbicide*
Aldicarb	*0.003*	*mg/l*	*insecticide*
Aldicarb sulfoxide	*0.003*	*mg/l*	*insecticide*
Aldicarb sulfone	*0.003*	*mg/l*	*insecticide*
Atrazine (Atranex, Crisazina)	*0.003*	*mg/l*	*herbicide*
Benzo(a)pyrene	*0.0002*	*mg/l*	*coal tar lining & sealants*
Carbofuran (Furadan 4F)	*0.04*	*mg/l*	*rootworm, weevil control*
Chlordane	*0.002*	*mg/l*	*termite control*
Dalapon	*0.2*	*mg/l*	*herbicide*
Dibromochloropropane(DBCP, Nemafume)	*0.0002*	*mg/l*	*pesticide, nematocide, soil fumigant*
2,4-D (2,4-dichlorophenoxyacetic acid)	*0.07*	*mg/l*	*herbicide, defoliant*
2,4,5-TP (Silvex)	*0.05*	*mg/l*	*herbicide, defoliant*
Di(diethylhexyl)adipate	*0.4*	*mg/l*	*plasticizer*
Di(diethylhexyl)phthalate	*0.006*	*mg/l*	*plasticizer*
Dinoseb (2,4-dinitro-6-sec-butylphenol)	*0.007*	*mg/l*	*insecticide, herbicide*
Diquat	*0.02*	*mg/l*	*herbicide*
Endothall	*0.1*	*mg/l*	*herbicide, defoliant*
Endrin	*0.002*	*mg/l*	*insecticide*
Ethylene Dibromide (EDB, Bromofume)	*0.0005*	*mg/l*	*gasoline additive, fumigants, & solvents*
Glyphosate	*0.7*	*mg/l*	*herbicide*
Heptachlor (H-34,Heptox)	*0.0004*	*mg/l*	*termite control*
Heptachlor epoxide	*0.0002*	*mg/l*	*insecticide*
Hexachlorobenzene	*0.001*	*mg/l*	*by-product of solvents & pesticides*
Hexachlorocyclopentadiene	*0.05*	*mg/l*	*pesticide, fungicide*
Lindane	*0.0002*	*mg/l*	*pesticide*
Methoxychlor (DMDT, Marlate)	*0.04*	*mg/l*	*insecticide*
Oxamyl (Vydate)	*0.2*	*mg/l*	*insecticide*
Pentachlorophenol (PCP)	*0.001*	*mg/l*	*herbicide, fungicide, wood preservative*
Picloram (Tordon)	*0.5*	*mg/l*	*herbicide, defoliant*
Polychlorinated Biphenyls (PCB, Aroclors)	*0.0005*	*mg/l*	*herbicide*
Simazine	*0.004*	*mg/l*	*herbicide*
2,3,7,8 TCDD (Dioxin)	*3E-8*	*mg/l*	*pesticide byproduct*
Toxaphene	*0.003*	*mg/l*	*pesticide*

SOC MONITORING WAIVER

The monitoring requirements for Diquat, Endothall, Glyphosate, and 2,3,7,8-TCDD (Dioxin) were waived by KDHE since they are not widely used in the state and have never been previously detected, or like glyphosate they are changed to a non-toxic chemical by chlorination. This monitoring waiver collectively saved public water supply systems close to one million dollars in laboratory analysis costs during the first compliance period.

TABLE 9.

UNREGULATED SYNTHETIC ORGANIC COMPOUNDS (SOC)

Compound Name	Uses (Trade Name)
Aldrin	*insecticide (Aldrex, Aldrite)*
Butachlor	*herbicide (Butanox)*
Carbaryl (1-Naphthalenol methylcarbamate)	*insecticide (Arylam, Seffein, Sevin)*
Dicamba	*herbicide (Banlene, Banval D., Cambilene Mediben)*
Dieldrin	*insecticide (HEOD, Dieldrex, Dieldrite)*
3-Hydroxycarbofuran	*insecticide*
Methomly	*insecticide (Lannate)*
Metolachlor	*herbicide (Bicep, Dual)*
Metribuzin	*herbicide (Sencor, Ssencoral)*
Propachlor	*herbicide (Bexton, Ramrod)*

MONITORING FREQUENCY

During the first compliance period of 1993 through 1995, all required PWSs performed monitoring for all SOCs listed in Tables 8 and 9, above, with the exception of the chemicals previously waived. **Atrazine** and **ethylene dibromide** (**EDB**) were the only contaminants in the SOC group that were detected over their MCL during this first compliance period.

Based on these monitoring results, KDHE with EPA approval, allowed PWSs to only monitor for atrazine and EDB during the subsequent compliance period of 1996 through 1998. Other than atrazine, a widely use herbicide, no other contaminants were detected by themselves. Alachlor, the only other pesticide detected, always appeared in conjunction with atrazine.

PWSs utilizing groundwater were required to monitor each POE at least once during the three year compliance period (1996-98). Small systems (population# 3,300)

utilizing surface water were required to monitor their POE a minimum of one quarter during the three year compliance period; collecting the water sample during the months of May or June. Large surface water systems (population > 3,300) were required to monitor their POE at least annually during the months of May or June.

PWSs using groundwater, that had no SOCs detected during the first compliance period (1993-95), tested for atrazine during 1996 through 1998, using an immunoassay method (EPA Method 4670). This immunoassay method was used because it is highly sensitive in detecting any contaminant in the triazine chemical family and is a fourth the cost of the regular drinking water method (EPA Method 507).

Groundwater systems with previous SOC detects and all surface water systems were required to perform the regular atrazine testing using EPA Method 507. This Method also detects alachlor, the only other pesticide detected during the previous compliance period.

SOC MONITORING RESULTS

A total of 293 PWSs collected water samples from 492 POEs for atrazine testing during 1998. Of these 293 PWSs only one groundwater system detected atrazine above its MCL of 3 **micrograms per liter** (**Fg/l**). This system had the well with the atrazine MCL violation taken out of service as soon as the results were reviewed by KDHE and the city. This PWS well was placed on quarterly monitoring. The subsequent quarterly sample showed atrazine not exceeding the MCL.

Of the 492 POE water samples collected during 1998, 120 samples or 24% percent of all samples showed atrazine detected. Of these 120 water samples, 102 detected atrazine at concentrations below 1 Fg/l, 12 at concentrations between 1 and 2 Fg/l, four at concentrations between 2 and 3 Fg/l, and two were greater than the MCL of 3 Fg/l.

Figure 7, on the following page, shows the number of PWSs that detected atrazine below the MCL in comparison to the number of systems that had no atrazine detected. Of the 82 PWSs that detected atrazine below the MCL, 43 were surface water systems and 39 were groundwater systems. No PWSs incurred SOC monitoring violations during 1998.

Figure 8, on the following page, shows all the water samples collected during 1998, and compares them according to the concentration of atrazine detected in each sample.

FIGURE 7.

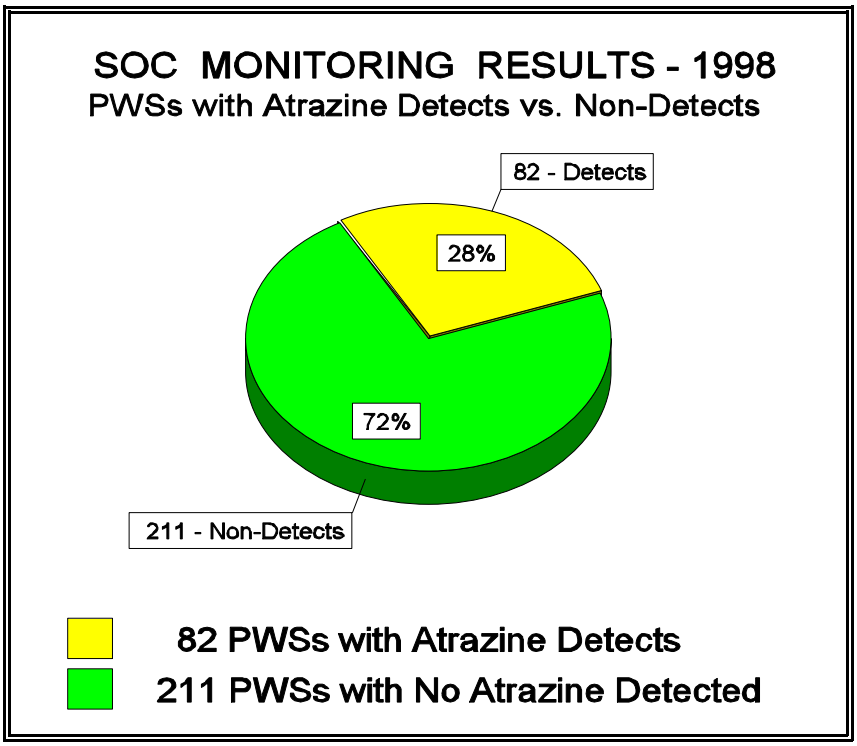
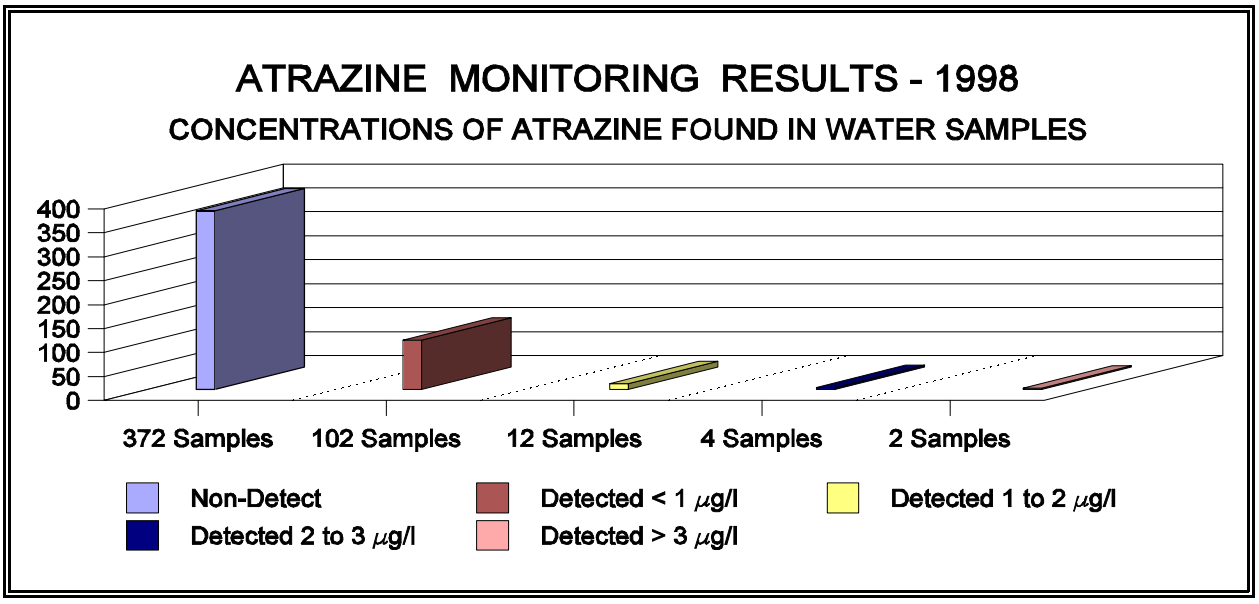


FIGURE 8.



VI. LEAD & COPPER

High exposure to metals in humans has long been recognized as a cause of adverse health effects. Lead has been singled out because of its possible appearance in drinking water and its high toxicity to humans. Copper, although an essential nutrient, also poses a health threat at elevated levels. Young children are especially susceptible to the toxic effects of these metals.

Lead and copper found in water pipes and in old plumbing solder can leach into the drinking water. Besides leaching from water pipes and solder, lead and copper can also leach from brass water faucet fixtures. As a step to reduce lead in drinking water, regulations prohibit the use of lead water pipes and lead plumbing solder.

Congress in the 1986 Safe Drinking Water Act amendments directed EPA to set regulations for lead and copper in drinking water. KDHE adopted these regulations by reference in K.A.R. 28-15-22.

These regulations apply to all community water systems and non-transient non-community water systems. These PWSs are required to monitor for lead and copper on a scheduled basis. If monitoring results indicate unacceptable levels of lead or copper, the water system is required to initiate corrosion control treatment techniques to minimize lead and/or copper contamination. Action levels set by this regulation are 0.015 milligrams per liter (mg/l) (15 micrograms per liter (Fg/l)) for lead and 1.3 mg/l (1,300 Fg/l) for copper.

LEAD AND COPPER MONITORING RESULTS

One hundred and seventy-two PWSs were scheduled to monitor for lead and copper during 1998. Six systems incurred monitoring violations by failing to perform their required routine and follow-up tap sampling. These PWSs were required to do public notice for such violations.

Fourteen systems exceeded the lead or copper action levels. These systems were required to proceed with corrosion control treatment techniques and if lead was exceeded, implement public education programs. Two systems failed to perform treatment installation. One system failed to do the required public education after exceeding the lead action level. Notices of violation were sent to these three systems requiring them to perform public notice for such violations.

These lead and copper violations translate to a 97% compliance rate for monitoring and a 99% compliance rate for treatment installation and public education. The names of the systems which incurred violations of this regulation during 1998 are listed in Appendix B.

VII. DISINFECTION BY-PRODUCTS

To ensure drinking water is safe and pathogen free it must be disinfected. The most commonly used method of disinfection is chlorination. Unfortunately, the chlorine added to water to kill harmful microorganisms also combines with organic matter naturally present in water to form chemical compounds called **trihalomethanes** or **THM**s. These THMs are suspected of being carcinogens.

Because of this concern, Kansas (K.A.R. 28-15-13), established a maximum contaminant level of 0.1 **milligrams per liter** (**mg/l**) for total THMs (**TTHM**) in drinking water. Compliance with this MCL of 0.1 mg/l is determined by adding the concentrations of all THMs detected in a water sample collected from the distribution system.

This regulation requires all PWSs serving 10,000 or more people to monitor for THMs on a quarterly basis. PWSs with TTHM results over the MCL of 0.1 mg/l must notify their customers by issuing public notice for the MCL violation. The following table shows the four THMs that must be monitored for in drinking water.

TABLE 10.

TRIHALOMETHANES (THMs)

TRICHLOROMETHANE (CHLOROFORM)	($CHCl_3$)
TRIBROMOMETHANE (BROMOFORM)	($CHBr_3$)
BROMODICHLOROMETHANE	($CHBrCl_2$)
DIBROMOCHLOROMETHANE	($CHBr_2Cl$)

MONITORING RESULTS FOR THMs

Thirty-nine systems were required to monitor for THMs during 1998. Most large PWSs in Kansas are surface water systems. Surface water generally has more suspended and dissolved organic material than groundwater. Of the 39 PWSs monitoring THMs, 24 were surface water and 15 were groundwater systems. No PWSs incurred MCL or monitoring violations during 1998. A 100 percent compliance rate was achieved for this regulation during 1998.

VIII. SURFACE WATER TREATMENT

Almost one third of all PWSs in Kansas use surface water for part or all of their drinking water. There are 112 PWSs that sell treated water to other systems bringing to 356 the total number to PWSs using surface water. These PWSs provide drinking water to about two thirds of the Kansas population. Water for these systems comes from rivers or man-made reservoirs located throughout the state.

Unlike most groundwater, that is protected by the earth's crust, surface water is exposed to the atmosphere and surface runoff. This exposure makes surface water more vulnerable to contamination than most groundwater. For this reason, regulations have been developed specifically for surface water and groundwater under the influence of surface water, such as springs and shallow wells which are susceptible to surface contamination.

Kansas regulations (K.A.R. 28-15-21), address specific treatment requirements for surface water. These regulations require that surface water systems, "provide filtration and disinfection treatment of source water . . . Systems which do not meet the requirements . . . are in violation . . . and shall issue public notice as required . . . " These regulations are collectively known as the **surface water treatment rule** or **SWTR**.

These regulations require PWSs to filter the water, and keep a record of turbidity readings of the treated water entering the distribution system. High turbidity levels adversely affect the efficiency of the disinfection process, contribute to the undesirable formation of **trihalomethanes** (**THMs**), and indicate viruses or Giardia lambia may be present. For these reasons turbidity limits are set depending on the type of filtration used.

A maximum turbidity level of 5.0 **nephelometric turbidity units** (**NTU**) is set for any single filtered water sample reading. Additionally, for a system to be in compliance, at least 95 percent of the filtered water samples must have turbidity levels less than or equal to 0.5 NTU.

These regulations also require that the filtering process in conjunction with the disinfection treatment remove or inactivate 99.99 percent of viruses and 99.9 percent of Giardia Lamblia cysts. The presence of viruses in drinking water can cause stomach cramps and/or gastroenteritis (intestinal distress). The chlorine (disinfectant) concentration in the water entering the distribution system is required to be at least 0.2 mg/l of free chlorine or 1.0 mg/l of combined chlorine. These chlorine residual readings must be taken at set intervals and recorded by the water operator. Turbidity and disinfection records are required to be submitted to KDHE on a monthly basis for compliance determination.

SURFACE WATER MONITORING RESULTS

During 1998, thirteen PWSs incurred 23 violations of the surface water treatment regulations. Of these 13 PWSs with violations, eight systems had 15 monitoring violations and five systems had eight treatment technique violations, exceeding turbidity levels.

There are a total of 112 surface water systems (including systems using both ground and surface water) required to comply with the **SWTR** regulations. These PWSs had a monitoring compliance rate of 93 percent and a treatment technique compliance rate of 96 percent for 1998.

As required, the 13 systems performed public notification of such violations to their customers. The names of the systems which incurred violations of this regulation during 1998 are listed in Appendix B.

IX. RADIONUCLIDES

Most radiation occurs naturally and is readily present in the environment. Radiation in groundwater commonly occurs when water comes in contact with the natural decay of uranium in rocks and soils. In most circumstances, this radiation occurs at such low levels it is harmless to human health.

Occasionally, in some areas of the state, these radiation levels do occur at higher levels which may present a risk to human health. For this reason, regulations requiring PWSs to monitor their drinking water for radionuclides have been adopted.

Table 11, on the following page, lists the radiological contaminants along with their common sources, and the corresponding MCLs as set by Kansas regulations (K.A.R. 28-15-13 (d) (1)).

Only community water systems are required to monitor their drinking water for radionuclides. At a minimum, these PWSs must monitor for radionuclides once every four years. PWSs with monitoring results greater than the MCL are required to monitor quarterly. These PWSs are also required to issue a public notice informing their customers of said MCL violation.

TABLE 11.
RADIONUCLIDES

CONTAMINANT	SOURCES / USES	MCL
Gross alpha	natural decay of uranium in rocks and soil	15 pCi/l
Gross beta	natural decay of uranium in rocks and soil, nuclear weapon production, pharmaceuticals	50 pCi/l or 4 mrem/yr
Radium 226	natural decay of uranium in rocks and soil	5 pCi/l
Radium 228	natural decay of uranium in rocks and soil	5 pCi/l
Strontium-90	artificial isotope, used in research and medicine, in industrial density measuring devices, in atomic batteries, in luminous paint	8 pCi/l
Tritium	man-made isotope, used as chemical tracer in research, in nuclear weapons production, in luminous instrument dials	20,000 pCi/l

Key: pCi/l = picoCurie per liter
mrem/yr = millirem per year

MONITORING RESULTS FOR RADIONUCLIDES

Three PWSs incurred four MCL violations for combined radium 226 & 228 during 1998. The population affected by these MCL violations were 517. These PWSs were notified by KDHE of the MCL violations and required to issue public notice for said violations. No PWSs had any radionuclide monitoring violations during 1998. The names of the systems which incurred radiological MCL violations are listed in Appendix B.

X. SUMMARY

Bacteriological monitoring resulted in 10 PWSs having acute total coliform MCL violations and 57 PWSs having non-acute MCL violations. These monitoring results translate to 95 percent of all systems being in compliance. The population affected by these MCL violations was 138,371 or less than 6 percent of the population served by all PWSs. Systems with total coliform monitoring

violations numbered 46, for a 96 percent compliance rate. The population affected by these monitoring violations was 5,190 or 0.2 percent of the population served by all systems. Overall, 97 PWSs had at least one bacteriological MCL or monitoring violation during 1998. This means that 1,025 systems or 91 percent of PWSs were in compliance with the total coliform rule.

In the organic contaminant group (**VOCs** and **SOCs**), only one compound - **atrazine** - caused a system to incur an MCL violation. One PWS out of 232 monitoring for SOC had an atrazine MCL violation. This translates to 99 percent of all PWSs monitoring in compliance, with only less than one percent having a violation. The PWS that incurred the atrazine MCL violation is currently in compliance.

In the inorganic contaminants (**IOCs**) group, **nitrate** and **selenium** were the only contaminants detected above the MCL during 1998. **Nitrate** MCL violations occurred in 32 out of 805 systems monitoring. This translates to a compliance rate of 96 percent of PWSs in compliance. The population affected by these nitrate MCL violations was 24,130, or less than 1 percent of the total population served in Kansas.

Selenium was detected above the MCL in five of the 152 PWSs required to monitoring during 1998. This translates to 99 percent of PWSs in compliance. The population affected by these five selenium MCL violations was 1,530 or less than 1 percent of the total population served in Kansas.

Lead and copper monitoring resulted in 6 PWSs with monitoring violations. The number of systems monitoring for lead and copper was 172. During 1998, 96 percent of PWSs were in compliance with monitoring requirements with less than 4 percent of systems incurring monitoring violations. Two systems had treatment installation violations and one systems failed to perform the public education requirements. Collectively, these results place 95 percent of all systems in compliance with lead and copper regulations during 1998.

Disinfection by-product monitoring for **THMs** resulted with no PWSs incurring monitoring or MCL violations. These results translate to a THM compliance rate of 100 percent during 1998.

The **surface water treatment rule** (**SWTR**) had 13 PWSs incur violations out of 112 PWSs using surface water. Of the 13 systems with violations, five had treatment technique violations, leaving 96 percent of PWSs in compliance. Eight of the 13 systems had monitoring/reporting violations, leaving 93 percent of PWSs in compliance. Collectively, these results placed 88 percent of all systems regulated by the SWTR in compliance during 1998.

Radionuclide monitoring resulted in three PWSs detecting radium 226/228 above the MCL. This amounts to a compliance rate of 99 percent with less than one percent of systems being in

violation. The population affected by these radium MCL violations was 517.

The overall compliance rate for Kansas public water supplies with drinking water regulations during 1998 was 85 percent. A total of 165 PWSs incurred at least one violation of a drinking water regulation. This left 957 PWSs having no violations out of the 1,122 PWSs operating during 1998.

Ninety-one percent of the Kansas population served by PWSs was in compliance with federal and state drinking water regulations during 1998. Of the 2,449,073 people served by all PWSs, 2,225,484 people were not affected by any violations, only 9 percent or 223,589 people were affected by all PWSs having violations.

The following table, shows the percentage of all PWSs that had no monitoring and/or MCL violations occurring during 1998 for each specific drinking water regulation.

TABLE 12.
PWSs - COMPREHENSIVE COMPLIANCE SUMMARY
FOR ALL VIOLATIONS

REGULATION	% OF PWSs IN COMPLIANCE
Total Coliform Rule	91 %
Nitrate / Nitrite	97 %
Inorganic Chemicals (IOCs)	99 %
Volatile Organic Compounds (VOCs)	100 %
Synthetic Organic Compounds (SOCs)	99 %
Total Trihalomethanes (TTHMs)	100 %
Lead and Copper Rule	99 %
Surface Water Treatment Rule	88 %
Radionuclides Rule	99 %

Table 13, below, shows a comparison of the overall compliance percentages for all PWSs over the last three years.

TABLE 13.
PWSs - COMPLIANCE COMPARISON
FOR 1996, 1997, AND 1998

% OF PWSs IN COMPLIANCE

REGULATION	1996	1997	1998
Total Coliform Rule	91 %	92 %	91 %
Nitrate / Nitrite	97 %	97 %	97 %
Inorganic Chemicals (IOCs)	97 %	97 %	99 %
Volatile Organic Compounds (VOCs)	100 %	99 %	100 %
Synthetic Organic Compounds (SOCs)	99 %	99 %	99 %
Total Trihalomethanes (TTHMs)	100 %	100 %	100 %
Lead and Copper Rule	----	97 %	99 %
Surface Water Treatment Rule	88 %	80 %	88 %
Radionuclides Rule	99 %	99 %	99 %

APPENDIX A

MCL VIOLATION TABLES AND DEFINITIONS

Appendix A
Violations Table
(with SDWIS Codes)

State:	**KANSAS**
Reporting Interval:	**1998 Calendar Year**

SDWIS Codes		MCL (mg/l)[1]	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
			Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
	Organic Contaminants (VOC / SOC)							
2981	**1,1,1-Trichloroethane**	**0.2**	**0**	**0**			**0**	**0**
2977	**1,1-Dichloroethylene**	**0.007**	**0**	**0**			**0**	**0**
2985	**1,1,2-Trichloroethane**	**0.005**	**0**	**0**			**0**	**0**
2378	**1,2,4-Trichlorobenzene**	**0.07**	**0**	**0**			**0**	**0**
2931	**1,2-Dibromo-3-chloropropane (DBCP)**	**0.0002**	**0**	**0**			**0**	**0**
2980	**1,2-Dichloroethane**	**0.005**	**0**	**0**			**0**	**0**
2983	**1,2-Dichloropropane**	**0.005**	**0**	**0**			**0**	**0**
2063	**2,3,7,8-TCDD (Dioxin)**	**$3x10^{-8}$**	**0**	**0**			**0**	**0**
2110	**2,4,5-TP**	**0.05**	**0**	**0**			**0**	**0**
2105	**2,4-D**	**0.07**	**0**	**0**			**0**	**0**

State:	KANSAS
Reporting Interval:	1998 Calendar Year

SDWIS Codes		MCL (mg/l)[1]	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
			Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
2265	Acrylamide				0	0		
2051	Alachlor	0.002	0	0			0	0
2050	Atrazine	0.003	1	1			0	0
2990	Benzene	0.005	0	0			0	0
2306	Benzo[a]pyrene	0.0002	0	0			0	0
2046	Carbofuran	0.04	0	0			0	0
2982	Carbon tetrachloride	0.005	0	0			0	0
2959	Chlordane	0.002	0	0			0	0
2380	cis-1,2-Dichloroethylene	0.07	0	0			0	0
2031	Dalapon	0.2	0	0			0	0
2035	Di(2-ethylhexyl)adipate	0.4	0	0			0	0
2039	Di(2-ethylhexyl)phthalate	0.006	0	0			0	0
2964	Dichloromethane	0.005	0	0			0	0
2041	Dinoseb	0.007	0	0			0	0
2032	Diquat	0.02	0	0			0	0
2033	Endothall	0.1	0	0			0	0

State:	KANSAS
Reporting Interval:	1998 Calendar Year

SDWIS Codes		MCL (mg/l)[1]	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
			Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
2005	Endrin	0.002	0	0			0	0
2257	Epichlorohydrin				0	0		
2992	Ethylbenzene	0.7	0	0			0	0
2946	Ethylene dibromide	0.00005	0	0			0	0
2034	Glyphosate	0.7	0	0			0	0
2065	Heptachlor	0.0004	0	0			0	0
2067	Heptachlor epoxide	0.0002	0	0			0	0
2274	Hexachlorobenzene	0.001	0	0			0	0
2042	Hexachlorocyclopentadiene	0.05	0	0			0	0
2010	Lindane	0.0002	0	0			0	0
2015	Methoxychlor	0.04	0	0			0	0
2989	Monochlorobenzene	0.1	0	0			0	0
2968	o-Dichlorobenzene	0.6	0	0			0	0
2969	para-Dichlorobenzene	0.075	0	0			0	0
2383	Total polychlorinated biphenyls	0.0005	0	0			0	0

State:	KANSAS
Reporting Interval:	1998 Calendar Year

SDWIS Codes		MCL (mg/l)[1]	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
			Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
2326	Pentachlorophenol	0.001	0	0			0	0
2987	Tetrachloroethylene	0.005	0	0			0	0
2984	Trichloroethylene	0.005	0	0			0	0
2996	Styrene	0.1	0	0			0	0
2991	Toluene	1	0	0			0	0
2979	trans-1,2-Dichloroethylene	0.1	0	0			0	0
2955	Xylenes (total)	10	0	0			0	0
2020	Toxaphene	0.003	0	0			0	0
2036	Oxamyl (Vydate)	0.2	0	0			0	0
2040	Picloram	0.5	0	0			0	0
2037	Simazine	0.004	0	0			0	0
2976	Vinyl chloride	0.002	0	0			0	0
2950	Total trihalomethanes	0.10	0	0			0	0

State:	KANSAS
Reporting Interval:	1998 Calendar Year

SDWIS Codes		MCL (mg/l)[1]	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
			Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
	Inorganic Contaminants (IOC)							
1074	Antimony	0.006	0	0			0	0
1005	Arsenic	0.05	0	0			0	0
1094	Asbestos	7 million fibers/Ò 10 µm long	0	0			0	0
1010	Barium	2	0	0			0	0
1075	Beryllium	0.004	0	0			0	0
1015	Cadmium	0.005	0	0			0	0
1020	Chromium	0.1	0	0			0	0
1024	Cyanide (as free cyanide)	0.2	0	0			0	0
1025	Fluoride	4.0	0	0			0	0
1035	Mercury	0.002	0	0			0	0
1040	Nitrate	10 (as Nitrogen)	66	32			0	0
1041	Nitrite	1 (as Nitrogen)	0	0			0	0

State:	KANSAS
Reporting Interval:	1998 Calendar Year

SDWIS Codes		MCL (mg/l)[1]	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
			Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
1045	Selenium	0.05	14	5			0	0
1085	Thallium	0.002	0	0			0	0
1038	Total nitrate and nitrite	10 (as Nitrogen)	0	0			0	0

State:	KANSAS
Reporting Interval:	1998 Calendar Year

SDWIS Codes		MCL (mg/l)[1]	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
			Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
	Radionuclide MCLs							
4000	Gross alpha	15 pCi/l	0	0			0	0
4010	Radium-226 and radium-228	5 pCi/l	4	3			0	0
4101	Gross beta	4 mrem/yr	0	0			0	0
	Subtotal		85	41			0	0

State:	KANSAS
Reporting Interval:	1998 Calendar Year

SDWIS Codes		MCL (mg/l)[1]	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
			Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
	Total Coliform Rule							
21	Acute MCL violation	Presence	10	10				
22	Non-acute MCL violation	Presence	66	57				
23,25	Major routine and follow up monitoring						77	46
28	Sanitary survey						0	0
	Subtotal		76	67			77	46

State:	KANSAS
Reporting Interval:	1998 Calendar Year

SDWIS Codes		MCL (mg/l)[1]	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
			Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
	Surface Water Treatment Rule (SWTR)							
	Filtered systems							
36	Monitoring, routine/repeat						15	8
41	Treatment techniques				8	5		
	Unfiltered systems							
31	Monitoring, routine/repeat						0	0
42	Failure to filter				0	0		
	Subtotal				8	5	15	8

State:	KANSAS
Reporting Interval:	1998 Calendar Year

SDWIS Codes		MCL (mg/l)[1]	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
			Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
	Lead and Copper Rule							
51	Initial lead and copper tap M/R						0	0
52	Follow-up or routine lead and copper tap M/R						6	6
58,62	Treatment Installation				2	2		
65	Public education				1	1		
	Subtotal				3	3	6	6

1. Values are in milligrams per liter (mg/l), unless otherwise specified.

Definitions for the Violations Table above

The following definitions apply to the Summary of Violations table.

Filtered Systems: **Water systems that have installed filtration treatment [40 CFR 141, Subpart H].**

Inorganic Contaminants: **Non-carbon-based compounds such as metals, nitrates, and asbestos. These contaminants are naturally-occurring in some water, but can get into water through farming, chemical manufacturing, and other human activities. Regulations have established MCLs for 15 inorganic contaminants [40 CFR 141.62].**

Lead and Copper Rule: **This rule established national limits on lead and copper in drinking water [40 CFR 141.80-91]. Lead and copper corrosion pose various health risks when ingested at any level, and can enter drinking water from household pipes and plumbing fixtures. States report violations of the Lead and Copper Rule in the following six categories:**

Initial lead and copper tap M/R: **A violation where a system did not meet initial lead and copper testing requirements, or failed to report the results of those tests to the State.**

Follow-up or routine lead and copper tap M/R: **A violation where a system did not meet follow-up or routine lead and copper tap testing requirements, or failed to report the results.**

Treatment installation: **Violations for a failure to install optimal corrosion control treatment system or source water treatment system which would reduce lead and copper levels in water at the tap. [One number is to be reported for the sum of violations in both categories].**

Lead service line replacement: **A violation for a system's failure to replace lead service lines on the schedule required by the regulation.**

Public education: **A violation where a system did not provide required public education about reducing or avoiding lead intake from water.**

Maximum Contaminant Level (MCL): **The highest amount of a contaminant that is allows in drinking water. MCLs ensure that drinking water does not pose either a short or long-term health risk. MCLs are defined in milligrams per liter (parts per million) unless otherwise specified.**

Monitoring: **Regulations specifies which water testing methods the water systems must use, and sets schedules for the frequency of testing. A water system that does not follow this schedule or methodology is in violation [40 CFR 141].**

States must report monitoring violations that are significant as determined by the EPA Administrator and in consultation with the States. For

purposes of this report, significant monitoring violations are major violations and they occur when no samples are taken or no results are reported during a compliance period. A major monitoring violation for the surface water treatment rule occurs when at least 90% of the required samples are not taken or results are not reported during the compliance period.

Organic Contaminants: **Carbon-based compounds, such as industrial solvents and pesticides. These contaminants generally get into water through runoff from cropland or discharge from factories. Regulations set legal limits on 54 organic contaminants that are to be reported [40 CFR 141.61].**

Radionuclides: **Radioactive particles which can occur naturally in water or result from human activity. Regulations set legal limits on four types of radionuclides: radium-226, radium-228, gross alpha, and beta particle/photon radioactivity [40 CFR 141]. Violations for these contaminants are to be reported using the following three categories:**

Gross alpha: **A violation for alpha radiation above MCL of 15 picocuries/liter. Gross alpha includes radium-226 but excludes radon and uranium.**

Combined radium-226 and radium-228: **A violation for combined radiation from these two isotopes above MCL of 5 pCi/L.**

Gross beta: **A violation for beta particle and photon radioactivity from man-made radionuclides above 4 millirem/year.**

SDWIS Code: **Specific numeric codes from the Safe Drinking Water Information System (SDWIS) have been assigned to each violation type included in this report. The violations to be reported include exceeding contaminant MCLs, failure to comply with treatment requirements, and failure to meet monitoring and reporting requirements. Four-digit SDWIS Contaminant Codes have also been included in the chart for specific MCL contaminants.**

Surface Water Treatment Rule (SWTR): **The SWTR establishes criteria under which water systems supplied by surface water sources, or ground water sources under the direct influence of surface water, must filter and disinfect their water [40 CFR 141, Subpart H]. Violations of the "Surface Water Treatment Rule" are to be reported for the following four categories:**

Monitoring, routine/repeat (for filtered systems): **A violation for a system's failure to carry out required tests, or to report the results of those tests.**

Treatment techniques (for filtered systems): **A violation for a system's failure to properly treat its water.**

Monitoring, routine/repeat (for unfiltered systems): **A violation for a system's failure to carry out required water tests, or to report the results of those tests.**

Failure to filter (for unfiltered systems): **A violation for a system's failure to properly treat its water. Data for this violation code will be supplied to the States by EPA.**

Total Coliform Rule (TCR): **The Total Coliform Rule establishes regulations for microbiological contaminants in drinking water. These contaminants can cause short-term health problems. If no samples are collected during the one month compliance period, a significant monitoring violation occurs. States are to report four categories of violations:**

Acute MCL violation: **A violation where the system found fecal coliform or E. coli, potentially harmful bacteria, in its water, thereby violating the rule.**

Non-acute MCL violation: **A violation where the system found total coliform in samples of its water at a frequency or at a level that violates the rule. For systems collecting fewer than 40 samples per month, more than one positive sample for total coliform is a violation. For systems collecting 40 or more samples per month, more than 5% of the samples positive for total coliform is a violation.**

Major routine and follow-up monitoring: **A violation where a system did not perform any monitoring. [One number is to be reported for the sum of violations in these two categories.]**

Sanitary Survey: **A major monitoring violation if a system fails to collect 5 routine monthly samples if sanitary survey is not performed.**

Treatment Techniques: **A water disinfection process that is required instead of an MCL for contaminants that laboratories cannot adequately measure. Failure to meet other operational and system requirements under the Surface Water Treatment and the Lead and Copper Rules have also been included in this category of violation for purposes of this report.**

Unfiltered Systems: **Systems that do not need to filter their water before disinfecting it because the source is very clean [40 CFR, Subpart H].**

Violation: **A failure to meet any state or federal drinking water regulation. Most violations require the water system to perform public notification to its consumers of said violation.**

APPENDIX B

LIST OF PUBLIC WATER SUPPLY SYSTEMS WITH MCL VIOLATIONS

STATE OF KANSAS
PWS SYSTEMS WITH NITRATE MCL VIOLATIONS: 1998

	PWS NAME	EPA #	Pop.	LOCATION	ST	ZIP	# of Vio.
1	ABILENE	2004112	6,242	ABILENE	KS	67410	3
2	ALMENA	2013701	384	ALMENA	KS	67627	1
3	BAZINE	2013505	375	BAZINE	KS	67516	4
4	BENNINGTON	2014303	568	BENNINGTON	KS	67422	1
5	CONWAY SPRINGS	2019118	1,384	CONWAY SPRINGS	KS	67031	1
6	DICKINSON COUNTY RWD #2	2004106	1,509	CARLTON	KS	67448	2
7	DONIPHAN COUNTY RWD #3	2004301	437	DENTON	KS	66017	2
8	FAIRFIELD HIGH SCHOOL - USD 310	2115514	285	LANGDON	KS	67549	4
9	GAYLORD	2018301	173	GAYLORD	KS	67638	3
10	GREEN	2002703	154	GREEN	KS	67447	3
11	HIAWATHA	2001305	3,603	HIAWATHA	KS	66434	2
12	JEWELL CO RWD #1	2008907	959	ESBON	KS	66941	3
13	KANSAS SOLDIERS HOME	2005701	254	FORT DODGE	KS	67843	1
14	KINSLEY	2004703	1,875	KINSLEY	KS	67547	1
15	KIRWIN	2014702	269	KIRWIN	KS	67644	2
16	LARNED STATE HOSPITAL	2014503	1,065	LARNED	KS	67550	2
17	LEONARDVILLE	2016120	374	LEONARDVILLE	KS	66449	2
18	LOGAN	2014701	633	LOGAN	KS	67646	4
19	LONG ISLAND	2014703	164	LONG ISLAND	KS	67647	4
20	LUCAS	2016702	452	LUCAS	KS	67648	3
21	NORWICH	2009505	455	NORWICH	KS	67118	3
22	OSBORNE COUNTY RWD #1A	2014103	81	ALTON	KS	67623	2
23	PORTIS	2014104	129	PORTIS	KS	67474	3
24	PRESTON	2015102	177	PRESTON	KS	67569	1
25	RAYMOND	2015901	125	RAYMOND	KS	67573	1
26	REPUBLIC	2015709	170	REPUBLIC	KS	66964	2
27	SALEM VALLEY CHRISTIAN SCHOOL	2108102	78	COPELAND	KS	67837	1
28	SUMNER CO RWD #5	2019101	585	CONWAY SPRINGS	KS	67031	1
29	TURON	2015503	393	TURON	KS	67583	1
30	VIOLA	2017313	185	VIOLA	KS	67149	1
31	WESTERN PLAIN CHRISTIAN SCHOOL	2106703	60	ULYSSES	KS	67880	2
32	WHITE CITY	2012703	533	WHITE CITY	KS	66872	1

TOTAL POPULATION AFFECTED: 24,130
TOTAL VIOLATIONS: 67
TOTAL PWS SYSTEMS: 32

STATE OF KANSAS
PWS SYSTEMS WITH SELENIUM MCL VIOLATIONS: 1998

	PWS NAME	EPA #	Pop.	LOCATION	ST	ZIP	# of Vio.
1	ALMENA	2013701	384	ALMENA	KS	67627	2
2	BURR OAK	2008906	278	BURR OAK	KS	66936	3
3	GLADE	2014708	138	GLADE	KS	67639	3
4	GOVE	2006303	103	GOVE	KS	67736	2
5	LOGAN	2014701	633	LOGAN	KS	67646	4

TOTAL POPULATION AFFECTED: 1,530
TOTAL VIOLATIONS: 14
TOTAL PWS SYSTEMS: 5

STATE OF KANSAS
PWS SYSTEMS WITH RADIONUCLIDE MCL VIOLATIONS: 1998

	PWS NAME	EPA #	Pop.	LOCATION	ST	ZIP	# of Vio.
1	BURDETT	2014501	275	BURDETT	KS	67523	2
2	CAPALDO WATER ASSOCIATION	2003715	152	FRONTENAC	KS	66762	1
3	COOLIDGE	2007501	90	COOLIDGE	KS	67836	1

TOTAL POPULATION AFFECTED: 517
TOTAL VIOLATIONS: 4
TOTAL PWS SYSTEMS: 3

STATE OF KANSAS
PWS SYSTEMS WITH ATRAZINE MCL VIOLATION: 1998

	PWS NAME	EPA #	Pop.	LOCATION	ST	ZIP	# of Vio.
1	MONTEZUMA	2006901	877	MONTEZU MA	KS	67867	1

TOTAL POPULATION AFFECTED: 877
TOTAL VIOLATIONS: 1
TOTAL PWS SYSTEMS: 1

STATE OF KANSAS
PWS SYSTEMS WITH TOTAL COLIFORM
ACUTE MCL VIOLATIONS: 1998

	PWS NAME	EPA #	Pop.	LOCATION	ST	ZIP	# of Vio.
1	BARNARD	2010503	129	BARNARD	KS	67418	1
2	BOURBON CO RWD 4	2001101	650	BRONSON	KS	66716	1
3	CHASE CO RWD 1	2001705	200	COTTONWOOD FALLS	KS	66845	1
4	EASTSIDE MOBILE HOME PARK	2005537	50	GARDEN CITY	KS	67846	1
5	MAHASKA	2020102	98	MAHASKA	KS	66955	1
6	OCONNELL YOUTH RANCH	2004514	26	LAWRENCE	KS	66046	1
7	OSAGE CO RWD #8	2013918	2,240	AUBURN	KS	66402	1
8	POTTAWATOMIE CO RWD #3	2014904	1,300	ONAGA	KS	66521	1
9	PRETTY PRAIRIE	2015501	601	PRETTY PRAIRIE	KS	67570	1
10	WILSON CO RWD #10	2020510	405	ALTOONA	KS	66710	1

TOTAL POPULATION AFFECTED: 5,699
TOTAL VIOLATIONS: 10
TOTAL PWS SYSTEMS: 10

STATE OF KANSAS
PWS SYSTEMS WITH TOTAL COLIFORM
NON-ACUTE MCL VIOLATIONS: 1998

	PWS NAME	EPA #	Pop.	LOCATION	ST	ZIP	# of Vio.
1	ABBYVILLE	2015512	140	ABBYVILLE	KS	67510	1
2	ALMENA	2013701	384	ALMENA	KS	67627	1
3	ALTON	2014102	115	ALTON	KS	67623	2
4	ATWOOD	2015301	1,342	ATWOOD	KS	67730	1
5	BARNARD	2010503	129	BARNARD	KS	67418	1
6	BELPRE	2004701	116	BELPRE	KS	67519	1
7	BOURBON CO RWD 4	2001101	650	BRONSON	KS	66716	1
8	CEDAR VALE	2001902	704	CEDAR VALE	KS	67024	2
9	CHASE CO RWD 1	2001705	200	COTTONWOOD FALLS	KS	66845	2
10	CLAYTON	2013706	91	CLAYTON	KS	67629	2
11	COFFEY CO RWD #2E	2003110	905	GRIDLEY	KS	66852	1
12	COLWICH ELEM SCHOOL-USD 267	2117308	350	ANDALE	KS	67001	1
13	COTTONWOOD FALLS	2001703	889	COTTONWOOD FALLS	KS	66845	1
14	DREAMLAND MOTEL	2106118	25	JUNCTION CITY	KS	66441	1
15	EASTON	2010301	405	EASTON	KS	66020	1
16	EASTSIDE MOBILE HOME PARK	2005537	50	GARDEN CITY	KS	67846	1
17	ELGIN	2001901	139	ELGIN	KS	67361	1
18	FREE BREAKFSAT	2119303	25	OAKLEY	KS	67748	1

19	GARDEN CITY	2005511	24,902	GARDEN CITY	KS	67846	1
20	GARDNER	2009106	4,684	GARDNER	KS	66030	1
21	GEARY CO RWD #1	2006103	216	JUNCTION CITY	KS	66441	1
22	HAYS	2005111	17,767	HAYS	KS	67601	1
23	HILLSBORO	2011505	2,704	HILLSBORO	KS	67063	1
24	JEFFERSON CO RWD #15	2008721	228	GRANTVILLE	KS	66429	1
25	JJ'S CORNER	2117349	30	MAIZE	KS	67101	1
26	JUNCTION CITY	2006108	20,604	JUNCTION CITY	KS	66441	1
27	KANSAS BIBLE CAMP	2115528	100	HUTCHINSON	KS	67502	1
28	KDOT-CIMARRON RIV RA 6-4505	2117504	27	TOPEKA	KS	66612	1
29	KDOT-SEWARD CO WGH STA 6-4030	2117508	80	LIBERAL	KS	67901	1
30	KINGMAN	2009503	3,302	KINGMAN	KS	67068	1
31	LACYGNE	2010703	1,066	LACYGNE	KS	66040	2
32	LEAVENWORTH	2010317	42,250	LEAVENWORTH	KS	66048	1
33	LEAVENWORTH CO RWD #6	2010305	240	TONGANOXIE	KS	66086	1
34	MAHASKA	2020102	98	MAHASKA	KS	66955	1
35	MATFIELD GREEN	2001702	30	MATFIELD GREEN	KS	66862	1
36	MIDWAY USA TRUCK - KAN OIL	2117507	25	LIBERAL	KS	67901	2
37	MITTEN TRUCKSTOP	2110902	27	OAKLEY	KS	67748	1
38	MONTGOMERY CO RWD #3	2012503	72	INDEPENDENCE	KS	67301	3
39	MUNDEN	2015708	143	MUNDEN	KS	66959	1
40	MOSCOW	2018902	252	MOSCOW	KS	67952	1
41	NEOSHO CO RWD #4	2013317	932	GALESBURG	KS	66740	1
42	OCONNELL YOUTH RANCH	2004514	26	LAWRENCE	KS	66046	1
43	OSAGE CO RWD #8	2013918	2,240	AUBURN	KS	66402	1
44	PARADISE	2016708	66	PARADISE	KS	67658	1
45	POTTAWATOMIE CO RWD #3	2014904	1,300	ONAGA	KS	66521	1
46	PRETTY PRAIRIE	2015501	601	PRETTY PRAIRIE	KS	67570	1
47	SHAWNEE CO RWD #7	2017711	313	TOPEKA	KS	66619	1
48	RANTOUL	2005902	200	RANTOUL	KS	66079	1
49	TATARRAX HILLS WTR DIST	2016132	96	MANHATTAN	KS	66502	1
50	TIMKEN	2016504	87	TIMKEN	KS	67582	2
51	ULYSSES	2006704	5,859	ULYSSES	KS	67880	1
52	WALTHERS OIL/15-36 TRUCK STOP	2120103	22	CUBA	KS	66940	1
53	WEST MINERAL	2002115	240	WEST MINERAL	KS	66782	1
54	WHITING	2008513	213	WHITING	KS	66552	1
55	WILSON CO RWD #10	2020510	405	ALTOONA	KS	66710	1
56	WINONA	2010903	240	WINONA	KS	67764	1
57	WONDERFULL AMERICAN CHINESE	2102903	25	CONCORDIA	KS	66901	1

TOTAL POPULATION AFFECTED: 138,371
TOTAL VIOLATIONS: 66
TOTAL PWS SYSTEMS: 57

STATE OF KANSAS
PWS SYSTEMS WITH TOTAL COLIFORM MONITORING VIOLATIONS: 1998

	PWS NAME	EPA #	Pop.	LOCATION	ST	ZIP	# of Vio.
1	A M LEWIS CONFERENCE CENTER	2116306	100	STOCKTON	KS	67669	1
2	ALL SEASONS CAMPGROUND	2117326	33	GODDARD	KS	67052	2
3	BISON	2016501	270	BISON	KS	67213	1
4	CAMP HAWK	2107908	25	NEWTON	KS	67114	1
5	COLUMBIAN CHEMICALS COMPANY	2106707	55	ULYSSES	KS	67880	1
6	COUNTRYVIEW MOBILE HOME PARK	2015520	50	HUTCHINSON	KS	67502	1
7	CRAWFORD CO RWD #1	2003703	365	FRONTENAC	KS	66763	2
8	D & W WATER COMPANY INC	2016101	81	MANHATTAN	KS	66502	1
9	DIAMONDS	2117345	25	WICHITA	KS	67215	4
10	EASTSIDE MOBILE HOME PARK	2005537	50	GARDEN CITY	KS	67846	4
11	EL ZARAPE WEST	2105532	25	GARDEN CITY	KS	67846	1
12	ELLIS CO RWD #1	2005118	209	SCHOENCHEN	KS	67667	1
13	ELLIS CO RWD #2	2005115	45	HAYS	KS	67601	1
14	ELLIS CO RWD #6	2005122	400	HAYS	KS	67601	1
15	FREE BREAKFSAT	2119303	25	OAKLEY	KS	67748	1
16	HAVENSVILLE	2014903	135	HAVENSVILLE	KS	66432	1
17	HEARTLAND CHRISTIAN SCHOOL	2119304	60	COLBY	KS	67701	4
18	JOHNSTON TRAILER COURT	2006116	22	JUNCTION CITY	KS	66441	1
19	KANSAS PARK & RESOURCES CENTER	2119501	26	ELLIS	KS	67637	1
20	LABETTE CO RWD #1	2009907	140	OSWEGO	KS	67356	1
21	LABETTE CO RWD #4	2009909	120	OSWEGO	KS	67356	1
22	LAKESHORE CLUB	2105723	25	DODGE CITY	KS	67801	1
23	LEAVENWORTH CO RWD #6	2010305	240	TONGANOXIE	KS	66086	1
24	MAPLE HILL	2019708	406	MAPLE HILL	KS	66507	1
25	MARION CO IMPROVEMENT DISTRICT	2011512	500	MARION	KS	66861	1
26	MCDONALD	2015303	234	MCDONALD	KS	67745	1
27	MITTEN TRUCKSTOP	2110902	27	OAKLEY	KS	67748	1
28	MOSCOW	2018902	252	MOSCOW	KS	67952	1
29	NEOSHO CO RWD #11	2013318	73	ERIE	KS	66733	3
30	NICODEMUS TWP(VILLA HOUSING PWS)	2006505	32	BOGUE	KS	67625	1
31	OSBORNE CO RWD #1A	2014103	81	ALTON	KS	67623	1
32	P J'S RESTAURANT	2108501	50	HOLTON	KS	66436	3
33	PRESTO OIL INC. #15	2105533	25	HOLCOMB	KS	67846	2
34	R & R MOBILE HOME PARK	2005510	55	GARDEN CITY	KS	67846	7
35	RAYMOND	2015901	125	RAYMOND	KS	67573	1
36	RED BUD LAKE ASSOCIATION	2004111	56	ABILENE	KS	67401	1
37	RUSSELL CO RWD #1	2016707	64	RUSSELL	KS	67665	2
38	ST JOSEPH ELEM SCHOOL	2115513	80	ANDALE	KS	67001	5
39	ST PAUL'S LUTHERAN SCHOOL	2115519	50	HAVEN	KS	67543	1
40	SUPPESVILLE COASTAL	2119102	30	MILTON	KS	67106	4
41	VIRGIL	2007307	98	VIRGIL	KS	66870	1
42	WALLACE	2019902	74	WALLACE	KS	67761	1
43	WESTSIDE TRAILER PARK	2005526	50	GARDEN CITY	KS	67846	2
44	WHEATLAND CAFÉ	2118503	25	HUDSON	KS	67545	1
45	WILSON CO RWD #3	2020503	37	NEODESHA	KS	66757	1
46	WINONA	2010903	240	WINONA	KS	67764	1

TOTAL POPULATION AFFECTED: 5,190
TOTAL VIOLATIONS: 77
TOTAL PWS SYSTEMS: 46

STATE OF KANSAS
PWS SYSTEMS WITH SURFACE WATER TREATMENT VIOLATIONS: 1998

ROUTINE & REPEAT MONITORING VIOLATIONS

	PWS NAME	EPA #	Pop.	LOCATION	ST	ZIP	# of Vio.
1	ANDERSON CO RWD #2	2000308	245	WESTPHALIA	KS	66093	1
2	BLUE MOUND	2010701	251	BLUE MOUND	KS	66010	2
3	COUNCIL GROVE	2012702	2,228	COUNCIL GROVE	KS	66846	1
4	HOWARD	2004901	852	HOWARD	KS	67349	1
5	MARION	2011507	1,977	MARION	KS	66861	1
6	PARKER	2010706	275	PARKER	KS	66072	7
7	ROCK SPRINGS 4H CAMP	2106114	63	JUNCTION CITY	KS	66441	1
8	WINFIELD	2003513	11,931	WINFIELD	KS	67156	1

TOTAL POPULATION AFFECTED: 17,822
TOTAL VIOLATIONS: 15
TOTAL PWS SYSTEMS: 8

TREATMENT TECHNIQUE VIOLATIONS

	PWS NAME	EPA #	Pop.	LOCATION	ST	ZIP	# of Vio
1	BRONSON	2001106	343	BRONSON	KS	66716	2
2	CHANUTE	2013307	9,488	CHANUTE	KS	67720	2
3	HUMBOLDT	2000111	2,178	HUMBOLDT	KS	66748	2
4	LACYGNE	2000703	1,066	LACYGNE	KS	66040	1
5	NEODESHA	2020502	2,837	NEODESHA	KS	66757	1

TOTAL POPULATION AFFECTED: 15,912
TOTAL VIOLATIONS: 8
TOTAL PWS SYSTEMS: 5

STATE OF KANSAS
PWS SYSTEMS WITH LEAD & COPPER VIOLATIONS: 1998

FOLLOW-UP or ROUTINE LEAD/COPPER TAP MONITORING VIOLATIONS

	PWS NAME	EPA #	Pop.	LOCATION	ST	ZIP	# of Vio
1	CEDAR VALE	2001902	760	CEDAR VALE	KS	67024	1
2	CHAUTAUQUA CO RWD #2	2001908	400	CEDAR VALE	KS	67024	1
3	COUNTRY VIEW MOBILE HOME PARK	2015520	50	HUTCHINSON	KS	67502	1
4	HIGHLAND	2004306	942	HIGHLAND	KS	66035	1
5	LONG ISLAND	2014703	164	LONG ISLAND	KS	67647	1
6	MAPLE HILL	2019708	400	MAPLE HILL	KS	66507	1

TOTAL POPULATION AFFECTED: 2,716
TOTAL VIOLATIONS: 6
TOTAL PWS SYSTEMS: 6

TREATMENT INSTALLATION VIOLATIONS

	PWS NAME	EPA #	Pop.	LOCATION	ST	ZIP	# of Vio.
1	FONTANA	2012107	131	FONTANA	KS	66026	1
2	NEWTON	2007905	16,770	NEWTON	KS	67114	1

TOTAL POPULATION AFFECTED: 16,901
TOTAL VIOLATIONS: 2
TOTAL PWS SYSTEMS: 2

PUBLIC EDUCATION VIOLATIONS

	PWS NAME	EPA #	Pop.	LOCATION	ST	ZIP	# of Vio.
1	MARION CO IMPROVEMENT DIST #2	2011512	500	MARION	KS	66861	1

TOTAL POPULATION AFFECTED: 500
TOTAL VIOLATIONS: 1
TOTAL PWS SYSTEMS: 1

APPENDIX C

LIST OF KDHE CONTACTS FOR ADDITIONAL INFORMATION

For additional copies of this report or questions regarding drinking water please contact KDHE's Bureau of Water or any of the following:

KDHE - BUREAU OF WATER
PUBLIC WATER SUPPLY SECTION ***www.kdhe.state.ks.us***
FORBES FIELD, BUILDING 283
TOPEKA, KS 66620

Director, Bureau of Water
KARL MUELDENER . . . . . (785) 296-5500

Public Water Supply Section Chief
DAVE WALDO . . . . . (785) 296-5514

Compliance and Data Management Unit Chief
DARREL PLUMMER . . . . . (785) 296-5523

Engineering and Permits Unit Chief
IRAJ POURMIRZA . . . . . (785) 296-5539

Engineering and Permits
DAN CLAIR . . . . . (785) 296-5516
JERRY McINTYRE . . . . . (785) 296-0735

Bacteriological, Surface Water Treatment, Radionuclides
JEAN HERROLD . . . . . (785) 296-5518

Lead and Copper, Trihalomethanes
RON CRAMER . . . . . (785) 296-5946

Inorganic, Volatile and Synthetic Compounds, Nitrate
PATTI VOIERS . . . . . (785) 296-3016

Data Management
ELLAN SPIVEY . . . . . (785) 296-6434

Compliance
PETER ARMESTO . . . . . (785) 296-6297

Safe Drinking Water Hotline . . . . . (800) 426-4791

KANSAS DON'T SPOIL IT!